Lack of hot water

1. **Things to keep in mind when trouble shooting a heater for a lack of hot water.**

   A. The Diesel Burner must be on for continuous hot water

> **NOTE:** The Electric Element is designed to be used during low heat demand situations, and will not supply continuous hot water

   B. What is the Water Flow.
   (Refer to Service Manual for Proper Water flow)

   C. The heater is only rated for a 55°F Temperature rise on the cold water coming in.

2. **Check the following if there is a lack of domestic hot water (all heaters):**

   A. Is the heater bypassed?

   B. Has the Outside water faucet been left on?

      i. If both the cold and hot valves are left in the on position, the outside water faucet acts like a secondary mixer valve, and the remaining hot water faucets will only produce warm water.

   C. Has the Internal Washing Machine Valve gone bad?

      i. If both the internal washing machine valve has gone bad it acts like a secondary mixer valve, and the remaining hot water faucets will only produce warm water.

   D. What is the Antifreeze concentration?

      i. The proper antifreeze concentration should be between 30%-50% antifreeze. If the concentration is over a 50% antifreeze concentration the anti freeze does not transfer the heat properly and there will be a lack of domestic hot water.

   E. What is the operating range of the control thermostat?

      i. 431/12, AHE-100-00S, 01S, 02S: 175 °F to 210 °
      ii. HHE-200/500-??? (all models): 160 F to 190 F
      iii. AHE-100-03S & AHE-100-04S: 160 °F to 190 °F
      iv. AHE-600-D01 & AHE-675-D01: 160 °F to 190 °
      v. AHE-450-D01: 160 F to 190 F
      vi. AHE-450-D02& D03, D04, AHE-600-D02 & D03, AHE-375-D01 & D02 & D03, AHE-525-D01, AHE-525-D02, & AHE-400: 155 °F to 185 °F.

   F. What is the Water Flow (GPM)

      i. Refer to the Service Manual for proper water flow.
      ii. Test the water flow where the customer is complaining about lack of hot water (i.e. shower, sink, etc.)

   G. Is the Mixer Valve functioning properly.

      i. The mixer valve's adjustment knob should turn freely. If the adjustment knob does not have free movement, the mixer valve must be replaced.

3. **Check the following for a lack of domestic hot water for model numbers: 431/12, AHE-100-00S, 01S, 02S.**

> **NOTE:** Anytime the mixer valve's adjustment knob is adjusted, or the mixer valve is replaced it will be necessary to set the water temperature for the hot water faucets between 115 °F - 123 °F.

   A. The bonding of the Domestic water coil to the Boiler Tank.

      i. The domestic water coil is wrapped around the outside of the boiler tank, and secured to the boiler tank with a heat transfer paste. If the bonding process has been compromised the heat transfer between the boiler tank and the domestic water will not be sufficient, and the heater will need to be replaced. The bonding process is typically compromised the heater is not winterized properly and the water in the domestic water coil freezes, expanding the copper, compromising the bonding process.

1. Lack of hot water - (continued)

4. Check the following for a lack of domestic hot water for model numbers: HHE-200, HHE-500, AHE-375, AHE-525, AHE-450, and AHE-400.

A. Is the Low Temperature Cut-Off Thermostat operating properly?

i. The purpose of the Low Temperature Cut-Off Thermostat is to shut off the interior heat when there is a demand for domestic hot water.

ii. The Low Temperature Cut-Off Thermostat should trip within 1-2 minutes after the hot water is turned on.

iii. When the Low Temperature Cut-Off Thermostat trips, the Low Temperature Cut-Off light on the Electronic controller will go out, and if the Diesel Burner Switch is in the on position, the Stir Pump will activate.

B. Is the Stir Pump operating properly.

i. The Stir Pump (Pump #3) should be active when:

1. The Diesel Burner Switch is in the ON position (Diesel Burner Status Light is illuminated).

2. The Low Temperature Cut-Off Thermostat is tripped (Low Temperature Cut-Off light is NOT illuminated).

ii. Verify the Stir pump is running

1. The stir pump should have a vibration, indicating it is operating.

2. Feel both the upper and lower hoses on the Stir Pump. If they are both hot, the stir pump is operating properly. If only one hose is hot, the antifreeze is not circulating. This could be due to a faulty stir pump, or a blocked hose.

NOTE: On Models: HHE-200, HHE-500, AHE-450, and AHE-525 the stir pump may be labeled Pump #3, on the Electronic Controller. The AHE-375 models do not use an electronic control board, and the stir pump is Circulation Pump #2.

NOTE: On Models: **AHE-400** There is no Pump #3. There is a jumper wire connecting both Pumps #2 & #3. When one is activated, they both are activated on the Electronic Controller. Pump #2 is the Stir Pump on the 400 Model. The Stir Pump will run When:

1. The Diesel Burner switch is in the on position and the Low Temperature Cutoff Thermostat is tripped.

Or

2. The Diesel Burner is running